Claim Rejections - 35 U.S.C. §102

Claim 1 is rejected under 35 U.S.C. §102(b) as being anticipated by Bender.

Claims 2, 3, 6, 10, 12 and 13 are also rejected under 35 U.S.C. §103(a) as being obvious over Bender.

Applicants respectfully disagree as Bender is unable to teach or suggest each and every element of the claimed invention. Bender also fails to teach or suggest unexpected improvements as are possible in the claimed invention.

The present invention is related to providing for the processing of organic chlorine compounds, which can decompose hard-to-decompose organic chlorine compounds such as dioxins, by methods which are improved with respect to efficiency of decomposition and processing time (see page 3, line 24 to page 4, line 4 of the specification). For example, the present invention in one preferred embodiment is concerned with a method of processing an organic chlorine compound for decomposing and eliminating the organic chlorine compound in an object to be processed. The method comprises a biological treatment process of causing a first microorganic body capable of oxidizing reduced nitrogen to come into contact with the object to be processed, and biologically processing the object to be processed in a state containing the first microorganic body, so as to decompose the organic chlorine compound. The method also comprises a reduced nitrogen adding process for adding reduced nitrogen to the object to be processed (see e.g., claim 1).

No such invention is taught or suggested in the prior art. In contrast to the present invention, Bender is concerned with the treatment of polluted or contaminated sites by providing to the site a composition comprising a constructed microbial mat of bacteria. Bender discloses in particular that ammonia can be removed from leachate

containing ammonia by the constructed microbial mat (see Example 12 and Figure 20). Bender also discloses that AOX (Absorbable Chlorinated Organic) compounds from pulp and paper mill effluent can be decomposed by the constructed microbial mat (see Example 6 and Figure 15A). The effects of ammonia removal and AOX decomposition result from independent events.

Applicants point out that through the present invention, it is possible to achieve higher efficiency in eliminating organic chlorine compounds through biological processing and the addition of reduced nitrogen. That is, the present invention requires "biological processing" with "a first microorganic body" as well as a "reduced nitrogen adding process", for a kind of conjugate reaction (e.g., co-oxidation reaction) in which organic chlorine compounds are oxidized in parallel with nitrifying reactions as represented by formulas (4) and (5) (see e.g., page 31 of the application). Applicants note that Bender discloses PCB treatment with autotrophic bacteria (cols. 32 and 11; Table 2). However, it appears that the autotrophic bacteria of Bender are not nitrifying bacteria, as Bender fails to disclose any decrease in the amount of ammonia through nitrifying by autotrophic bacteria. Yet, in the claimed invention, the first microorganic body is capable of oxidizing reduced nitrogen. That is, in that Bender does not appear to disclose nitrifying bacteria, Bender does not appear to teach or suggest a first microorganic body capable of oxidizing reduced nitrogen, as claimed. Bender therefore does not appear to teach or suggest all elements of the claimed invention.

Applicants further point out that in the present invention, it is possible to achieve improved efficiency and processing time in eliminating organic chlorine compounds such as dioxin, by the addition of reduced nitrogen. That is, in the present invention, reduced nitrogen, which facilitates the progress of nitrifying reactions, is added to

the object to be processed. Bender, in contrast, contains no teaching or suggestion with respect to adding reduced nitrogen to water containing an organic chlorine compound (e.g., PCB) in the treatment of water. Regarding the addition of reduced nitrogen for the decomposition of dioxins (not for metabolism), Bender contains neither teaching nor suggestion concerning the possibility of high efficiency in decomposing organic chlorine compounds such as dioxins with a microorganic body, and the addition of reduced nitrogen. Nor does Bender contain any teaching or suggestion concerning unexpected improvements with respect to efficiency and processing time in eliminating organic chlorine compounds, as in the claimed invention (see Tables 1-8 of the application).

Clearly, Bender cannot be considered to teach or suggest all elements of the claimed invention, much less the unexpected improvements associated with such invention. Applicants urge withdrawal of the rejections.

Claim Rejections - 35 U.S.C. §112

Claims 9-13 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants respectfully point out that the rejection is moot in light of the claim amendments indicated herein. Applicants urge withdrawal of all rejections.

Claim Objections

Claims 4, 5, 7, 8 and 14 are objected to as being dependent on a rejected base claim. Applicants respectfully submit that the objection is moot in light of the claim amendments and remarks herein. Applicants urge withdrawal of all objections.

In view of the amendments and remarks above, Applicants submit that this application is in condition for allowance and request favorable action thereon.

In the event this paper is not considered to be timely filed, Applicants hereby petition for an appropriate extension of time. The fee for this extension may be charged to our Deposit Account No. 01-2300. The Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment associated with this communication to Deposit Account No. 01-2300, referencing Attorney Docket No. 107350-00003.

Respectfully submitted,

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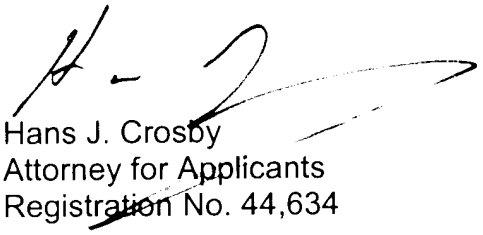

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Enclosures: Marked-Up Copy of Claim Amendments
Associate Power of Attorney

MARKED-UP COPY OF CLAIM AMENDMENTS

1. (Amended) A method of processing an organic chlorine compound for decomposing and eliminating the organic chlorine compound in an object to be processed,

said method comprising a biological treatment process of causing a first microorganic body capable of oxidizing reduced nitrogen to come into contact with said object to be processed, and biologically processing said object to be processed in a state containing said first microorganic body, so as to decompose said organic chlorine compound; and

a reduced nitrogen adding process for adding reduced nitrogen to said object to be processed.

2. (Amended) A method of processing an organic chlorine compound [according to claim 1, further comprising a reduced nitrogen adding process for adding reduced nitrogen to said object to be processed] for decomposing and eliminating the organic chlorine compound in an object to be processed which contains biological sludge,

said method comprising a biological treatment process of causing a first microorganic body capable of oxidizing reduced nitrogen to come into contact with said object to be processed, and biologically processing said object to be processed in a state containing said first microorganic body, so as to decompose said organic chlorine compound,

wherein said biological treatment process comprises:

an anaerobic treatment process in which said object to be processed containing said first microorganic body keeping a biological activity thereof by way of a biological treatment in an aerobic atmosphere is held in an anaerobic atmosphere,

wherein, in said aerobic treatment process, supply of a gas containing oxygen to said object to be processed is blocked, so as to form an anaerobic atmosphere, and said anaerobic atmosphere is maintained.

4. (Amended) A method of processing an organic chlorine compound [according to claim 1,] for decomposing and eliminating the organic chlorine compound in an object to be processed,

said method comprising a biological treatment process of causing a first microorganic body capable of oxidizing reduced nitrogen to come into contact with said object to be processed, and biologically processing said object to be processed in a state containing said first microorganic body, so as to decompose said organic chlorine compound,

wherein said biological treatment process comprises:

an anaerobic treatment process in which said object to be processed containing said first microorganic body keeping a biological activity thereof by way of a biological treatment in an aerobic atmosphere is held in an anaerobic atmosphere.

5. (Amended) A method of processing an organic chlorine compound [according to claim 1, further comprising:] for decomposing and eliminating the organic chlorine compound in an object to be processed,

said method comprising:

a biological treatment process for causing a first microorganic body capable of oxidizing reduced nitrogen to come into contact with said object to be processed, and biologically processing said object to be processed in a state containing said first microorganic body, so as to decompose said organic chlorine compound; and

an oxidized nitrogen eliminating process of reducing and eliminating oxidized nitrogen contained in said object to be processed with a second microorganic body capable of reducing oxidized nitrogen in an anaerobic atmosphere.

9. (Amended) A method of processing an organic chlorine compound according to claim 3, further comprising:

a mixing process of an object to be processed, in which said object to be processed in at least one of said aerobic treatment process, said oxidized nitrogen eliminating process, and [said] an anaerobic treatment process is added by another object to be processed, different therefrom, containing an organic chlorine compound.

10. (Amended) A method of processing an organic chlorine compound according to claim 1, wherein, as said first microorganic body and/or a second microorganic body, those in a dehydrated cake form whose moisture is at least partly eliminated or in a lyophilized powder form are used.

12. (Amended) A method of processing an organic chlorine compound according to claim 3, wherein said aerobic treatment process has:

a pH adjusting step of adjusting the pH of said object to be processed containing said first microorganic body and reduced nitrogen to a range of 5 to 9; [and/or] or

a desalting step of adjusting said salt concentration of said object to be processed to 4% or lower; or both said pH adjusting step and said desalting step.

13. (Amended) A method of processing an organic chlorine compound according to claim 1 [2], wherein, in said reduced nitrogen adding process and/or reduced nitrogen adding step, reduced nitrogen is added to said object to be processed such that the content of said reduced nitrogen with respect to 1 ng of said organic chlorine compound becomes 0.01 to 10.0 g-N.